

**Amendments to the Claims:**

**This listing of claims will replace all prior versions and listing of claims in the application.**

**Please cancel claims 85 and 86 without prejudice or disclaimer.**

**Please amend claims 61 and 89 as follows.**

**Please add new claims 95 to 101 as follows.**

Claims 1 to 60. (cancelled)

61. (currently amended) An isolated nucleic acid molecule comprising a BRCA2 gene containing a nucleotide sequence variation selected from the group consisting of:

(a) a thymidine at a position in exon 15 corresponding to nucleotide ~~474~~ 199 of SEQ ID NO: 2;  
and

~~(b) a thymidine at a position in exon 15 corresponding to nucleotide 173 of SEQ ID NO: 2.~~

62. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises by a cytosine at a position corresponding to position 1093 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

63. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a cytosine at a position corresponding to position 1342 of SEQ ID NO: 4.

64. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a guanosine at a position corresponding to position 1593 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

65. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a cytosine at a position corresponding to position 2457 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

66. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises an adenine at a position corresponding to position 2908 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

67. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a guanosine at a position corresponding to position 3199 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

68. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a guanosine at a position corresponding to position 3624 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

69. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a cytosine at a position corresponding to position 4035 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

70. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a guanosine at a position corresponding to position 7470 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

71. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises an adenine at a position corresponding to position 9079 of SEQ ID NO: 4, and wherein the nucleotide at position 1342 is adenine.

72. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes histidine at an amino acid position corresponding to position 289 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

73. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes histidine at an amino acid

position corresponding to position 372 of SEQ ID NO: 5.

74. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes serine at an amino acid position corresponding to position 455 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

75. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes histidine at an amino acid position corresponding to position 743 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

76. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes isoleucine at an amino acid position corresponding to position 894 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

77. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes aspartate at an amino acid position corresponding to position 991 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

78. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes lysine at an amino acid position corresponding to position 1132 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

79. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes valine at an amino acid position corresponding to position 1269 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

80. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes serine at an amino acid position corresponding to position 2414 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

81. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises a sequence that encodes threonine at an amino acid position corresponding to position 2951 of SEQ ID NO: 5, and wherein the amino acid at position 372 is asparagine.

82. (withdrawn) The isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence comprises a nucleotide sequence that encodes a polypeptide set forth in SEQ ID NO: 5, wherein the amino acid at position 372 is asparagine.

83. (withdrawn) An isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene further comprises one or more of the nucleotide sequences selected from the group consisting of:

- (a) the nucleotide sequence as set forth in SEQ ID NO: 6;
- (b) a nucleotide sequence that encodes a polypeptide set forth in SEQ ID NO: 7;
- (c) a nucleotide sequence as set forth in SEQ ID NO: 8;
- (d) a nucleotide sequence that encodes a polypeptide set forth in SEQ ID NO: 9;
- (e) a nucleotide sequence as set forth in SEQ ID NO: 10;
- (f) a nucleotide sequence that encodes a polypeptide as set forth in SEQ ID NO: 11;
- (g) a nucleotide sequence as set forth in SEQ ID NO: 12; and
- (h) a nucleotide sequence that encodes a polypeptide as set forth in SEQ ID NO: 13.

84. (withdrawn) An isolated nucleic acid molecule comprising a BRCA2 gene wherein the molecule has a sequence comprising one or more of the group consisting of:

- (a) a sequence wherein the nucleotide corresponding to position 1093 of the nucleotide sequence set forth in SEQ ID NO: 4 is not an adenine;

(b) a sequence wherein the nucleotide corresponding to position 1593 of the nucleotide sequence set forth in SEQ ID NO: 4 is not an adenine;

(c) a sequence wherein the nucleotide corresponding to position 2908 of the nucleotide sequence set forth in SEQ ID NO: 4 is not a guanosine;

(d) a sequence wherein the nucleotide corresponding to position 9079 of the nucleotide sequence set forth in SEQ ID NO: 4 is not an guanosine;

(e) a sequence wherein the nucleotide sequence does not encode asparagine at the amino acid position corresponding to position 289 of the amino acid sequence set forth in SEQ ID NO: 5;

(f) a sequence wherein the nucleotide sequence encodes histidine at the amino acid position corresponding to position 289 of the amino acid sequence set forth in SEQ ID NO: 5;

(g) a sequence wherein the nucleotide sequence does not encode asparagine at the amino acid position corresponding to position 455 of the amino acid sequence set forth in SEQ ID NO: 5;

(h) a sequence wherein the nucleotide sequence encodes histidine at the amino acid position corresponding to position 455 of the amino acid sequence set forth in SEQ ID NO: 5;

(i) a sequence wherein the nucleotide sequence does not encode valine at the amino acid position corresponding to position 894 of the amino acid sequence set forth in SEQ ID NO: 5;

(j) a sequence wherein the nucleotide sequence encodes isoleucine at the amino acid position corresponding to position 894 of the amino acid sequence set forth in SEQ ID NO: 5;

(k) a sequence wherein the nucleotide sequence does not encode alanine at the amino acid position corresponding to position 2951 of the amino acid sequence set forth in SEQ ID NO: 5; and

(l) a sequence wherein the nucleotide sequence encodes threonine at the amino acid position corresponding to position 2951 of the amino acid sequence set forth in SEQ ID NO: 5.

85. (canceled)

86. (canceled)

87. (withdrawn) An isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene comprises a thymidine at a position corresponding to position 7834 of SEQ ID NO: 4.

88. (withdrawn) An isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene comprises an exon 15 nucleotide sequence as set forth in SEQ ID NO: 2.

89. (withdrawn) An isolated nucleic acid molecule according to claim 61, wherein the nucleotide sequence of the BRCA2 gene comprises an exon 16 nucleotide sequence as set forth in SEQ ID NO: 3.

90. (withdrawn) The isolated nucleic acid molecule of claim 62, wherein the BRCA2 gene containing a nucleotide sequence variation is SEQ ID NO: 8.

91. (withdrawn) The isolated nucleic acid molecule of claim 63, wherein the BRCA2 gene containing a nucleotide sequence variation is SEQ ID NO: 4.

92. (withdrawn) The isolated nucleic acid molecule of claim 63, wherein the BRCA2 gene containing a nucleotide sequence variation is SEQ ID NO: 6.

93. (withdrawn) The isolated nucleic acid molecule of claim 63, wherein the BRCA2 gene containing a nucleotide sequence variation is SEQ ID NO: 10.

94. (withdrawn) The isolated nucleic acid molecule of claim 63, wherein the BRCA2 gene containing a nucleotide sequence variation is SEQ ID NO: 12.

95. (new) The isolated nucleic acid molecule of claim 61, wherein said nucleic acid molecule is operably linked to one or more expression control elements.

96. (new) A vector comprising an isolated nucleic acid molecule of claim 61.

97. (new) A host cell transformed to contain the nucleic acid molecule of any one of claims 61, 95 or 96.

98. (new) A host cell comprising a vector of claim 96.

99. (new) A host cell of claim 98, wherein said host is selected from the group consisting of prokaryotic hosts and eukaryotic hosts.

100. (new) A method for producing a polypeptide comprising the step of culturing a host cell transformed with the nucleic acid molecule of any one of claims 61, 95 or 96 under conditions in which the protein encoded by said nucleic acid molecule is expressed.

101. (new) The method of claim 100, wherein said host cell is selected from the group consisting of prokaryotic hosts and eukaryotic hosts.